REMARKS

The present Amendment is in response to the Office Action having a mailing date of April 2, 2004. Claims 1-3, 5-8 and 10-12 and 14-15 are pending in the present Application. Applicant has amended claims 1, 2, 5, 11, 12, 14, and 15. Consequently, claims 1-3, 5-8 and 10-12 and 14-15 remain pending in the present Application.

Applicant has amended claims 2, 5, 11, 12, 14, and 15 to more clearly recite the portion of the object(s) being processed. Consequently, Applicant respectfully submits that no new matter is added and that the scope of claims 2, 5, 11, 12, 14, and 15 is not narrowed. Applicant has amended claim 1 to recite that the positions are rendered in raster order, thereby harmonizing claims 1 and 10. Accordingly, Applicant respectfully submits that no new matter is added by the amendment to claim 1.

In the above-identified Office Action, the Examiner rejected claims 1, 2, and 10 under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 4,918,626 (Watkins) in view of U.S. Patent No. 5,684,939 (Foran). The Examiner also rejected claims 3, 5-8, 11, 12, 14, and 15 under 35 U.S.C. § 103 as being unpatentable over Watkins in view of Foran, in further view of U.S. Patent No. 5,872,902 (Kuchkuda).

In the above-identified Office Action, the Examiner rejected claims 1, 2, and 10 under 35 U.S.C. § 103 as being obvious in light of Watkins in view of Foran.

Applicant respectfully traverses the Examiner's rejection. Independent claim 1 recites a method for generating a graphical image on a display from data describing at least one object. The display includes a plurality of positions, each of which has an area. The method recited in claim 1 includes several steps. Steps (a)-(c) include various steps performed for multiple objects, or polygons, at a current position. Steps (a)-(c) determine whether a particular object intersects

the current position, provides a mask for the object at the current position and performs antialiasing for the object at the position. Step (d) repeats steps (a)-(c) for all of the remaining objects that intersect the current position. Thus, steps (a)-(d) ensure that the determination of intersection and the provision of masks are provided on a per pixel basis. Step (e) recites that the steps (a) through (d) are then repeated for other positions **after** step (d) has been performed for the current position. Claim 1 then recites that each position corresponds to a pixel and the current position corresponds to a current pixel and that the positions are rendered position by position in raster order. Independent claim 10 recites a system analogous to the method recited in claim 1. Thus, the system recited in claim 10 renders the object(s) are rendered position by position (equivalent to pixel by pixel as recited in claim 10) in raster order. Consequently, independent claim 10 thus also recites that the processor block provide the output for "all" of the object(s) intersecting the current pixel before providing an output for any of the at least one object intersecting a subsequent pixel and recites that the interpolator and the mask utilizing means render the object(s) position by position in raster order.

Thus, the method and system recited in independent claims 1 and 10, respectively, ensure that the determination of intersections and masks is performed pixel by pixel. In other words, the method and system recited in claims 1 and 10, respectively, complete determining whether any object intersects the pixel, providing masks and performing antialiasing for a current pixel, before completing these tasks for the next pixel. Thus, the method and system recited in claims 1 and 10, respectively, process and render the objects pixel-by-pixel in raster order. Only one pass through the data for the objects is thus required. Specification, page 18, lines 5-6. Linked lists, therefore, need not be used and the memory and resources required for linked lists are freed. Specification, page 18, lines 6-10.

In contrast, Watkins in view of Foran fails to teach a method including the recited combination of steps and the recited combination of elements including the recited processor block, interpolator and mask utilizing means. In particular, Watkins in view of Foran fails to teach or suggest determining whether objects intersect a current pixel (position), providing masks for objects intersecting a current pixel, antialiasing the objects intersecting the current pixel, then performing these steps for objects intersecting subsequent pixels such that the image is rendered pixel by pixel in raster order. Watkins thus fails to teach or suggest the combination of steps (a), (b), (d) and (e) in the manner recited and fails to teach or suggest the recited processor block, interpolator, and mask utilizing means which cooperate to render the object in the manner recited..

Watkins does describe performing antialiasing of polygons in a graphical display. However, Watkins describes a system which determines intersections and masks polygon by polygon, rather than pixel by pixel. Watkins specifically states that the polygons are scan converted. Watkins, col. 8, lines 43-50. The scan conversion process determines the pixels that the polygon intersects. Watkins, col. 10, lines 43-46. The scan conversion is **only** done for the pixels within the particular polygon on which the system of Watkins is currently operating. This scan conversion also determines the sub-pixels within each pixel that are occupied by the polygon. Watkins, col. 10, lines 46-56. A mask indicating which of the sub-pixels are intersected by the polygon is then provided, Watkins, col. 10, line 57-col. 11, line 5. See also, Watkins, col. 11, line 25-col. 12, line 12 (for a subsequent polygon). Using the mask, antialiasing can be performed. Once these operations are completed for a **polygon**, a subsequent polygon is scan converted. Watkins, col. 11, lines 6-13. After scan conversion, a raster subsystem places the data in raster order for depiction on a display.

Consequently, Watkins determines the pixels intersected by a polygon and provides a mask for all of the pixels intersected by a polygon (i.e. scan converts the polygon) before performing these steps for another polygon. With respect to claim 1, Watkins would not performs steps (a)-(c) and then step (d) and (e). In other words, Watkins would not perform the intersection determining and mask providing steps for all of the polygons intersecting the current pixel, then move to the next pixel. Instead, Watkins would perform the intersection determining and mask providing steps for each polygon, then moves to the next polygon. Once these steps are performed, Watkins passes the data to the raster converter. Watkins, col. 13, lines 46-51. Consequently, Watkins does not teach the steps recited in claims 1 in the order recited (e.g. step (d) depending upon steps (a), (b), and (c) and thus commencing later). Moreover, Watkins does not teach or suggest rendering the graphical image pixel-by-pixel in raster order, as recited in claim 1.

With respect to claim 10, because Watkins scan converts the image polygon by polygon and performs antialiasing for the polygon on a polygon-by-polygon basis, Watkins fails to teach or suggest the recited processor block, which outputs all of the data for **objects** intersecting a particular pixel before providing output for **any object** for a subsequent pixel, in combination with the recited interpolator and mask utilizing means that also render the object(s) pixel-by-pixel in raster order. Stated differently, Watkins fails to describe a combination that, because of the functions and cooperation of elements, can render object(s) in the graphical image pixel-by-pixel in raster order. Watkins, therefore, fails to teach or suggest the method and system recited in claims 1 and 10, respectively.

The teachings of Foran fail to remedy the defects of Watkins. Applicant agrees that Foran discusses using masks to perform antialiasing. However, like Watkins, Foran describes scan

converting the polygons. The process of scan converting the polygons includes providing a coverage mask for supersampling. Foran, Abstract, lines 3-9. The coverage mask is based on the size of a supersample region (such as a pixel) and indicates the regions that a particular polygon covers. Foran, col. 3, lines 62-67. Consequently, the masks provided by the scan converter of Foran are provided polygon by polygon. This data is then transferred to the raster subsystem of Foran, which converts the data to raster order. Foran, col. 5, lines 10-18.

Thus, like Watkins, Foran determines the intersections between a polygon and pixels and provides the appropriate mask(s) on a per polygon basis. With respect to claim 1, Foran would not performs steps (a)-(c) and then step (d) and (e). In other words, Foran would not perform the intersection determining and mask providing steps for all of the polygons intersecting the current pixel, then move to the next pixel, thereby rendering the graphical image in raster order. Instead, Foran would perform the intersection determining and mask providing steps for each polygon, then moves to the next polygon. Once these steps are performed, Foran passes the data to the raster converter. Similarly, with respect to claim 10, because Foran scan converts the image polygon by polygon and provides masks on a polygon-by-polygon basis, Foran also fails to teach or suggest the recited processor block, which outputs all of the data for **objects** intersecting a particular pixel before providing output for **any object** for a subsequent pixel, in combination with the recited interpolator and mask utilizing means that also render the object(s) pixel-by-pixel in raster order.

Because neither Foran nor Watkins teach or suggest the features described above, any combination of Watkins and Foran would also fail to teach or suggest these features. If the teachings of Foran were added to those of Watkins, the combination might use the mask of Foran in lieu of the mask of Watkins. However, there is no indication in Foran that the order in which

the masks would be generated should be different from the order described in Watkins. Consequently, the combination of Watkins and Foran would still scan convert the polygons in essentially the same manner. Thus, the steps of the method recited in claim 1 would not be performed in the order recited in claim 1. In contrast to claim 1, the combination of Watkins and Foran would fail to teach or suggest rendering the graphical image in raster order. Similarly, the elements of the combination of Foran and Watkins would not have the recited functions and cooperate in the manner of the processor block, interpolator, and mask utilizing means recited in claim 10. Consequently, Watkins in view of Foran cannot teach or suggest the method recited in claim 1 and the system recited in claim 10. Accordingly, Applicant respectfully submits that claims 1 and 10 are allowable over the cited references.

Claim 2 depends upon independent claim 1. Consequently, the arguments herein apply with full force to claim 2. Accordingly, Applicant respectfully submits that claim 2 is allowable over the cited references.

The Examiner also rejected claims 3, 5-8, 11, 12, 14, and 15 under 35 U.S.C. § 103 as being obvious in light of Watkins in view of Foran, in further view of Kuchkuda.

Claims 3 and 5-8 depend upon independent claim 1. Claims 11, 12, 14, and 15 depend upon independent claim 10. Consequently, the arguments herein with respect to Watkins and Foran apply with full force to claims 3, 5-8, 11-12, and 14-15. In particular, Watkins in view of Foran fails to teach or suggest processing certain data for a subsequent pixel after data is processed for all of the objects intersecting the current pixel, the result of which allows objects to be rendered pixel by pixel rather than object by object.

Kuchkuda fails to remedy the defects of Watkins in view of Foran. The cited portions of Kuchkuda fail to mention performing a method for antialiasing including the steps of determining

intersections of objects with a current position, providing masks for the objects intersecting the current pixel and performing antialiasing for all the objects intersecting a current position before performing these steps for another position. Similarly, the cited portions of Kuchkuda fail to mention components having the function and cooperation of the recited processor block, interpolator and mask utilizing means. Consequently, any method or system made using the teachings of Watkins in view of Foran in further view of Kuchkuda would fail to teach or suggest these features. Thus, Watkins in view of Foran in further view of Kuchkuda cannot teach or suggest step (e) of claim 1 and the recited combination of elements of claim 10. Accordingly, Applicant respectfully submits that claims 3, 5-8, 11-12 and 14-15 are allowable over the cited references.

Applicant's attorney believes that this application is in condition for allowance. Should any unresolved issues remain, Examiner is invited to call Applicant's attorney at the telephone number indicated below.

Respectfully submitted,

SAWYER LAW GROUP LLP

August 2, 2004

Janyce R. Mitchell
Attorney for Applicant(s)
Reg. No. 40,095
(650) 493-4540